

The opinion in support of the decision being entered today was not written for publication and is not binding precedent of the Board

Paper No. 18

UNITED STATES PATENT AND TRADEMARK OFFICE

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BEFORE THE BOARD OF PATENT APPEALS  
AND INTERFERENCES

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Ex parte M. ALLEN NORTHRUP

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Appeal No. 2001-0103  
Application 08/763,465<sup>1</sup>

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ON BRIEF

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Before WILLIAM F. SMITH, GARRIS, and MOORE, Administrative Patent Judges.  
MOORE, Administrative Patent Judge.

**DECISION ON APPEAL**

This is an appeal under 35 U.S.C. § 134 from a final rejection of claims 1-38, all of the claims of this pending application.

**CLAIMS**

Claims 1, 26, and 27 are representative of the claims on appeal, and read as follow:

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<sup>1</sup> This appeal is related to appeal no. 2001-0062 of application 08/774,170.

1. In a microfabricated chemical reactor, the improvement comprising:  
a sleeve reaction chamber constructed of silicon-based or non-silicon based materials;  
said sleeve reaction chamber including a slot therein for insertion of reaction fluid.

26. The improvement of Claim 1, wherein said sleeve reaction chamber is constructed and is adapted to be inserted into an instrument constructed to contain an array of such reaction chambers.

27. The improvement of Claim 26, wherein said array of such reaction chambers is operatively connected via an array of microinjectors to a microelectrophoresis array.

### THE REFERENCES

In rejecting the appealed claims under 35 U.S.C. §102, the Examiner relies on the following reference:

Pace (Pace)	4,908,112	Mar. 13, 1990
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In rejecting the appealed claims under 35 U.S.C. §103, the Examiner relies upon the following references:

Heller et al. (Heller)	5,632,957	May 27, 1997
Northrup et al. (Northrup I)	5,639,423	Jun. 17, 1997

In rejecting the appealed claims for obviousness-type double patenting, the Examiner relies upon the following reference:

Northrup et al., (Northrup II)	5,589,136	Dec. 31, 1996 (filed Jun. 20, 1995)
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### THE REJECTIONS

Claims 27-29 and 32 stand rejected under 35 U.S.C. §112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which the Appellant regards as the invention.

Claims 1, 2, 3, 6, 9, 11, 17, 22, 30, and 33-37 stand rejected under 35 U.S.C. §102(b) as being anticipated by Pace.

Claims 1-14, 17-18, 22-23, and 25-38 stand rejected under 35 U.S.C. §103(a) as being unpatentable over Heller.

Claims 15-16 and 19-20 stand rejected under 35 U.S.C. §103(a) as being unpatentable over Heller in view of Northrup I.

Claims 1-38 are rejected under the judicially created doctrine of obviousness-type double patenting over claims 1-22 of Northrup II.

We affirm the rejection of Claims 27-29 and 32 under 35 U.S.C. §112, second paragraph, and the rejection of claims 1-38 under the judicially created doctrine of obviousness-type double patenting. We reverse the rejection of claims 1, 2, 3, 6, 9, 11, 17, 22, 30, and 33-37 under 35 U.S.C. §102(b), the rejection of claims 1-14, 17-18, 22-23 and 25-38 under 35 U.S.C. §103(a), and the rejection of claims 15-16 and 19-20 stand rejected under 35 U.S.C. §103(a).

### DISCUSSION

The present invention relates to microfabricated instruments for performing microscale chemical reactions. More specifically, the claims are directed to sleeve devices as reaction chambers which can be utilized in arrays for a high throughput microreaction unit. The reaction sleeve also allows for introduction of a secondary tube or insert that contains the reaction mixture. (Appeal Brief, page 2, lines 8-18).

#### The Rejection of Claims 27-29 and 32 Under 35 U.S.C. §112, Second Paragraph

The Examiner states in the final rejection that claims 27-29 and 32 are unclear in that the array has not been positively recited. The Examiner asserts that it is unclear how the array limitation limits a microfabricated chemical reactor as the array has not

been positively recited in claims 27-29 or 32. (Examiner's Answer, page 4, lines 6-9; page 8, lines 12-13).

The Appellant states that claim 27 depends from claim 26, and claim 26 recites that the sleeve reaction chamber is "constructed and adapted to be inserted into an instrument constructed to contain an array of such reaction chambers" (Appeal Brief, page 12, lines 8-14) (emphasis in original). The Appellant reasons that as the element is positively recited in claim 26, the rejection is improper.

As set forth in Amgen Inc. v. Chugai Pharmaceutical Co., Ltd., 927 F.2d 1200, 1217, 18 USPQ2d 1016, 1030 (Fed. Cir. 1991):

The statute requires that "[t]he specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention." A decision as to whether a claim is invalid under this provision requires a determination whether those skilled in the art would understand what is claimed. See Shatterproof Glass Corp. v. Libbey-Owens Ford Co., 758 F.2d 613, 624, 225 USPQ 634, 641 (Fed. Cir. 1985)(Claims must "reasonably apprise those skilled in the art" as to their scope and be "as precise as the subject matter permits")

"[T]he definiteness of the language employed must be analyzed – not in a vacuum, but always in light of the teachings of the prior art and of the particular application disclosure as it would be interpreted by one possessing the ordinary skill in the pertinent art." In re Moore, 439 F.2d 1232, 1235, 169 USPQ 236, 238 (CCPA 1971).

Claim 1, a Jepson claim, recites a microfabricated chemical reactor which comprises a sleeve reaction chamber including a slot. Claim 26 limits the sleeve reaction chamber of claim 1 by stating that each sleeve reaction chamber be "constructed" and "adapted" such that it can be in the form of an array in the instrument. Claim 26 is directed to a sleeve reaction chamber, not an array of sleeve reaction

chambers. Thus, the statement in claim 27 of “said array” does technically not enjoy antecedent support in claim 26. To this extent, we agree that claims 27-29 and 32 are indefinite. We therefore affirm this rejection.

The Rejection of Claims 1, 2, 3, 6, 9, 11, 17, 22, 30, and 33-37 Under 35 U.S.C. §102(b) as Anticipated by Pace

The Examiner states that Pace teaches a “sleeve reaction chamber” 30, 38 having slots 10, 20 for performing reactions. The slots 10, 20 are said to receive fluid directly from a buffer reservoir 14 and a sample chamber 18. (Examiner’s Answer, page 4, lines 12-15).

The Appellant in the appeal brief “calls upon” the Examiner to explain how Pace teaches the claimed “sleeve reaction chamber” which includes a slot therein for insertion of reaction fluid. (Appeal Brief, page 13, lines 1-3).

Our review of the Pace reference indicates that, in accord with the Examiner’s position, the trapezoidal channels 10, 20 in base 30 are closed in with the glass plate 38 and as such may be considered a sleeve chamber. However, we part company with the Examiner’s interpretation which holds that channels 10, 20 are simultaneously “slots” for the insertion of reaction fluid. Channel 10 is the separation conduit (column 6, lines 15-16), while channel 20 is the injection conduit (column 6, line 18). Neither provides for insertion of a reaction fluid through a slot in the manner stated by the Examiner (and as claimed by the Appellant).

In order for a reference to be anticipatory, it must disclose, either explicitly or implicitly, every element of the claim. See In re King, 801 F.2d 1324, 1326, 231 USPQ

136, 138 (Fed. Cir. 1986). As the Examiner has not satisfactorily explained how the slots are present, we cannot sustain this rejection.<sup>2</sup>

The Rejection of Claims 1-14, 17-18, 22-23, and 25-38 Under 35 U.S.C. §103(a) as Unpatentable over Heller

The Examiner states that Heller teaches a microfabricated device for reaction and analysis, such as PCR, having a sleeve reaction chamber (Figure 9) having a fluid containment system portion (136) with a viewing window (138) and inlet port (137) disposed over a reactive chip. (Examiner's Answer, page 5, lines 3-6). The Examiner thus concludes that it would have been obvious to provide the fluid entry port (137) as a slot to provide fluid communication (Examiner's Answer, page 5, lines 16-19).

The Appellant questions where in Heller is found a sleeve reaction chamber including a slot, and states that there is no suggestion that vessel 136 constitutes a sleeve reaction chamber. (Appeal Brief, page 15, lines 9-14). The Examiner states in reply that Heller teaches in Figure 9 a generally rectangular reaction volume bounded on the sides, top, and bottom with the exception of inlet and/or outlet ports. (Examiner's Answer, page 11, lines 10-14).

Federal Circuit precedent provides us with guidance with respect to the construction of claims undergoing examination. See Burlington Industries v. Quigg, 822 F.2d 1581, 1583, 3 USPQ2d 1436, 1438 (Fed. Cir. 1987) (claims undergoing examination are given their broadest reasonable construction consistent with the

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<sup>2</sup> We note that Pace discusses a filling of reservoirs 14 and 16 utilizing an access hole for injection (column 8, lines 67-68). See the "Other Issues" section of this Opinion.

specification); In re Prater, 415 F.2d 1393, 1404 05, 162 USPQ 541, 550-51 (CCPA 1969) (same).

Claim 1 requires a sleeve reaction chamber having a slot for insertion of reaction fluid. We find that the art (at least as it is applied by the Examiner) insufficient to support the prima facie case of obviousness. The so-called “fluid containment system” of Figure 9, upon closer inspection of the specification of Heller, is a “sample containment vessel 136 to contain the biological material under analysis or test” (Column 15, lines 39-41). Figure 9 itself does not appear to show anything other than a splash-guard type of arrangement. See especially the oval shaped portions in the upper portion of Figure 9, which support the wall of the sample containment vessel above the reactive chip. Further, the “vessel” is open. This disclosure simply would not have suggested the invention as claimed to one of ordinary skill in the art. We do not see the sleeve chamber, nor the slot therein as required by claim 1.

Where the Examiner fails to establish a prima facie case, the rejection is improper and will be overturned. In re Fine, 837 F.2d 1071, 1074, 5 USPQ2d 1596, 1598 (Fed. Cir. 1988).

The rejection of Claims 1-14, 17-18, 22-23, and 25-38 under 35 U.S.C. §103 as being unpatentable over Heller is reversed.

The Rejection of Claims 15-16 and 19-20 Under 35 U.S.C. §103(a) as being Unpatentable over Heller in view of Northrup I

The Examiner states that Claims 15-16 and 19-20 are rejected under 35 U.S.C. §103(a) as being unpatentable over Heller as applied to claims 1-14, 17-28, 22-23, and 25-38, further in view of Northrup I.

As we have reversed the rejection over Heller as it applies to claims 1-14, 17-28, 22-23, and 25-38, we likewise reverse this rejection for the reasons enumerated above.

The Obviousness-Type Double Patenting Rejection of Claims 1-38 over Northrup II

Claims 1-38 stand rejected under the judicially-created doctrine of obviousness-type double patenting over claims 1-22 of Northrup II. More specifically, the Examiner states that the claims of Northrup II teach a sleeve reaction chamber with a slot constructed to enable insertion of an insert or liner and a heating means for the chamber, a window, a test strip, materials of construction and in an array in combination with a hand-held instrument having microinjectors or microelectrophoresis, an optical detector, and a controller as in instant claims 1-3, 5-6, 9-10, 21, 25-32, and 34-36 (Examiner's Answer, page 7, lines 7-15). The Examiner additionally notes that the remaining claims are obvious as the claimed materials were obvious choices for microfabrication, that providing a space for the detector in the window would have been an obvious design choice, that it would have been obvious to provide a cooler as well as a heater to better control temperature, that it would have been obvious to provide a plurality of elements to perform a plurality of reactions, and that it would have been obvious to provide a flow path for electrophoresis.

The sum total of the Appellant's argument is that "[a] comparison of Claims 1 and 2, for example of the instant application and claims 1 and 2 of the patent will clearly establish that the claims are patentable [sic] distinct". (Appeal Brief, page 17, lines 8-9). The Appellant further notes the differences in scope of the claims, but offers no reasoning as to why the Examiner's position on obviousness is improper.



An obviousness-type double patenting rejection is a question of law. In re Goodman, 11 F.3d 1046, 1052, 29 USPQ2d 2010, 2015 (Fed. Cir. 1993), Texas Instruments Inc. v. International Trade Commission, 988 F.2d 1165, 1179, 26 USPQ2d 1018, 1029 (Fed. Cir. 1993). Such a rejection rejects claims to subject matter in a pending application which are different but not patentably distinct from the subject matter claimed in a prior patent. Goodman, 11 F.3d at 1052, 29 USPQ2d at 2015, In re Braat, 937 F. 2d 589, 592, 19 USPQ2d 1289, 1291-1292 (Fed. Cir. 1991).

In the present instance, we note that claims 1 and 2 of Northrup II recite a microfabricated reactor having a sleeve reaction chamber, the chamber having a slot, and the slot (per claim 1) constructed to enable insertion of an insert and (per claim 2) being configured to enable insertion of a reaction fluid, and a heater. Claim 1 of the present invention recites a sleeve reaction chamber including a slot for insertion of reaction fluid. Claim 15, which depends from claim 1, recites a heater.

We note that the scope of the claims differs solely by virtue of the different order of listing of the elements in the claims, and slight changes in wording. For example, the slot is configured to accept an insert in Claim 1 of Northrup II, but that same slot is configured for insertion of a fluid in Claim 2 of Northrup II. Accordingly, the claims of Northrup II and the present invention are clearly no more than obvious variants as outlined by the Examiner.

We therefore affirm this rejection.

#### Summary of Decision

The Rejection of Claims 27-29 and 32 under 35 U.S.C. §112, second paragraph, is affirmed.

The Rejection of Claims 1, 2, 3, 6, 9, 11, 17, 22, 30, and 33-37 under 35 U.S.C. §102(b) as being anticipated by Pace is reversed.

The Rejection of Claims 1-14, 17-18, 22-23, and 25-38 under 35 U.S.C. §103(a) as being unpatentable over Heller is reversed.

The rejection of Claims 15-16 and 19-20 under 35 U.S.C. §103(a) as being unpatentable over Heller in view of Northrup I is reversed.

The rejection of Claims 1-38 under the judicially created doctrine of obviousness-type double patenting over claims 1-22 of Northrup II is affirmed.

#### OTHER ISSUES

We note that Pace, column 8, line 65 to column 9, line 19 describes a method of using the analytical device. One step includes filling reservoirs and samples through an access hole (not shown) in glass plate 38. Neither the Appellant nor the Examiner have considered this disclosure of an opening enabling insertion of a fluid on this record and we commend it to their attention for appropriate consideration if further prosecution on the merits is undertaken. It may be that such an access hole corresponds to the slot required by claim 1 on appeal.

Time Period for Response

No time period for taking any subsequent action in connection with this appeal  
may be extended under 37 CFR § 1.136(a).

**AFFIRMED**

WILLIAM F. SMITH  
Administrative Patent Judge

BRADLEY R. GARRIS  
Administrative Patent Judge

JAMES T. MOORE  
Administrative Patent Judge

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